

# Notice of Allowability

Application No.

09/613,162

Examiner

Barbara J. Musser

Applicant(s)

MESING ET AL.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the interview summary dated 9/27/04.
2. ☒ The allowed claim(s) is/are 1-5,7-10,31 and 33-38.
3. ☒ The drawings filed on 7/10/00 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All b) ☐ Some\* c) ☐ None of the:
    1. ☐ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.  
**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
  - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
    - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
  - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

## Attachment(s)

- |   |   |
|---|---|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892)  | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)                                 |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                | 6. <input checked="" type="checkbox"/> Interview Summary (PTO-413),<br>Paper No./Mail Date <u>9/27/04</u> . |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),<br>Paper No./Mail Date _____ | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment   |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit<br>of Biological Material          | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance                        |
|   | 9. <input type="checkbox"/> Other _____   |

### EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Carmen Santa Maria on 9/27/04.

The application has been amended as follows: The title has been changed to --  
Method of making a polyimide resin and carbon fiber molded tube clamp--.

The claims have been amended as follows:

1. (Currently amended) A process for forming a tube clamp comprising the steps of:

providing a plurality of sheets of curable material having embedded fibers, each sheet having a length and a width to form a plane, and a thickness, the fibers embedded in the curable material to form a matrix in which the fibers are substantially within the plane of the sheet;

layering ~~the~~ a plurality of the sheets of curable material in a layup tooling mold to achieve a predetermined ~~preselected~~ thickness, the layering including the steps of :

layering a first plurality of the sheets along a contour the contours of the layup tooling having to form a bottom ply layer of predetermined shape thickness;

layering a second plurality of sheets to a predetermined thickness to form a top ply layer;

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providing filler to fill regions in the mold between the bottom ply layer and the top ply layer, the bottom ply layer, the top ply layer and the filler comprising a preform;

heating while applying pressure and curing the preform said material while bonding together the bottom ply layer, the top ply layer and the filler as well as the plurality of sheets of the bottom ply layer and the top ply layer to at least near net shape; then

removing said the cured preform material from said layup tooling mold while retaining the contours shape of said layup tooling without exposing fibers along the contours.

2. (Currently amended) The process of claim 1 wherein the step of providing the plurality of sheets and layering of the first plurality of the sheets to form the bottom layer further includes layering sheets of unidirectionally oriented fibers in a polymer resin matrix, and wherein the step of removing said the cured material preform further includes removing said the cured material preform while maintaining the fibers along the ~~contour~~ contours of the layup tooling as continuous.
3. (Currently amended) The process of claim 1 wherein the step of providing a plurality of sheets and layering of the first plurality of the sheets to form the bottom layer further includes providing and layering sheets of woven fibers in a polymer resin matrix, and wherein the step of removing said the cured material preform further includes removing said the cured material preform while maintaining the fibers along the ~~contour~~ contours of the layup tooling as continuous.
4. (Currently amended) The process of claim 1 wherein the step of layering the first plurality of sheets to form the bottom layer further includes layering sheets of fibers bi-directionally oriented fibers in a polymer resin matrix, the bi-directionally oriented fibers lying within the plane of the ~~plurality of~~ sheets.
5. *nm* (Original) The process of claim 1 wherein the curable matrix is a polyimide resin matrix and the fibers are carbon fibers.

6. (Canceled)
7. (Currently amended) The process of claim 6 1 wherein the step of providing the filler material includes selecting a plurality of plies cut to a predetermined shape to fill a region between the bottom ply layer and the top ply layer.
8. (Currently amended) The process of claim 7 wherein the step of providing the sandwiching filler material to fill regions in the mold between the top ply layer and the bottom ply layer includes layering sheets of random fiber mat comprising chopped fiber in polymer resin, between the top and bottom ply layers wherein the bottom ply layer comprises ~~comprising~~ sheets having fibers embedded in the curable material to form a matrix in which the fibers are substantially within the plane of each sheet layered along the contours of the layup tooling so that the tube clamp adjacent to a tube includes no exposed fiber so as to dispense with the use of a wear sleeve between the tube clamp and the tube.
9. (Currently amended) The process of claim 1 wherein the step of heating, applying pressure and curing includes autoclaving ~~said material~~ the preform at a predetermined temperature and pressure.
10. (Currently amended) The process of claim 1 wherein the step of heating, applying pressure and curing includes processing in a match metal press having a movable upper platen at a predetermined temperature and pressure.
- 11– 30. Cancelled without prejudice.
31. (Previously presented) The process of claim 2 wherein the layering the sheets of the unidirectionally oriented fibers further includes layering adjacent sheets so that the fibers in the adjacent sheets are angled at predetermined angular orientations.
32. (Canceled)

33. (Currently amended) The process of claim 6 1 wherein the step of layering a the first plurality of sheets to a predetermined thickness to form a the bottom layer includes layering sheets of woven fiber.
34. (Currently amended) The process of claim 6 1 wherein the step of layering a the second plurality of sheets to a predetermined thickness to form a the top layer includes layering sheets of unidirectional fiber.
35. (Currently amended) The process of claim 6 1 wherein the step of layering a second plurality of sheets to a predetermined thickness to form a top layer includes layering sheets of woven fiber.
36. (New) The process of claim 1 wherein the step of providing filler to fill regions in the mold between the bottom ply layer and the top ply layer further includes selecting filler from the group consisting of plies cut to size, polyimide resin, chopped fiber molding compound, polyimide ceramic foams and mixtures of these materials.
37. (New) A process for forming a tube clamp comprising the steps of:
- providing a plurality of sheets of curable material having embedded fibers, each sheet having a length and a width to form a plane, and a thickness, the fibers embedded in the curable material to form a matrix in which the fibers are substantially within the plane of the sheet;
  - layering a first plurality of the sheets of curable material in a first layup tooling mold to achieve a predetermined thickness, the first layup tooling mold having a first predetermined shape, the layering including the steps of :
    - layering sheets of the first plurality of sheets along the contours of the layup tooling to form a first bottom ply layer of predetermined thickness;
    - layering sheets of the first plurality of sheets to a predetermined thickness to form a first top ply layer;

providing filler to fill regions in the mold between the first bottom ply layer and the first top ply layer, the first bottom ply layer, the first top ply layer and the filler comprising a first preform;

heating while applying pressure and curing the first preform into a first composite of near net shape while bonding together the first bottom ply layer, the first top ply layer and the filler as well as the plurality of sheets of the first bottom ply layer and the first top ply layer; then

removing the cured first composite from said first layup tooling mold while retaining the contours of the first layup tooling without exposing fibers along the contours of the first layup tooling mold;

layering a second plurality of the sheets of curable material in a second layup tooling mold to achieve a predetermined thickness, the second layup tooling mold having a second predetermined shape, the first predetermined shape and the second predetermined shape having mating surfaces, the layering including the steps of :

layering sheets of the second plurality of sheets along the contours of the second layup tooling to form a second bottom ply layer of predetermined thickness;

layering sheets of the second plurality of sheets to a predetermined thickness to form a second top ply layer;

providing filler to fill regions in the mold between the second bottom ply layer and the second top ply layer, the second bottom ply layer, the second top ply layer and the filler comprising a second preform;

heating while applying pressure and curing the second preform into a second composite of near net shape while bonding together the second bottom ply layer, the second top ply layer and the filler as well as the plurality of sheets of the second bottom ply layer and the second top ply layer; then

removing the cured second composite from said second layup tooling mold while retaining the contours of the second layup tooling without exposing fibers along the contours of the second layup tooling mold; and

mating the first cured composite and the second cured composite along the corresponding mating interfaces of the first predetermined shape and the second predetermined shape to form a tube clamp.

38. (New) A process for forming a tube clamp comprising the steps of:

providing a plurality of fiber plies;

layering the fiber plies in a layup tooling mold to achieve a predetermined thickness, the layering including the steps of :

layering a first plurality of the plies along the contours of the layup tooling to form a bottom ply layer of predetermined thickness;

layering a second plurality of the plies to a predetermined thickness to form a top ply layer;

providing filler to fill regions in the mold between the bottom ply layer and the top ply layer;

injecting resin into the mold;

heating the fibers and the resin while applying pressure and curing to at least near net shape to form a composite; then

removing the cured composite from said layup tooling mold while retaining the contours of said layup tooling without exposing fibers along the contours.

#### ***Reasons for Allowance***

2. The following is an examiner's statement of reasons for allowance: the prior art of record does not teach or fairly suggest a method of making a fiber containing clamp wherein the clamp is made of multiple fiber sheets or resin impregnated fiber sheets on a contoured tool to form a bottom layer, layering multiple fiber sheet or resin

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impregnated fiber sheets to form a top layer, placing filler between the top and bottom layers, and forming them into a near-net shape clamp section under heat and pressure via curing of the resin. It is noted that curing is considered to encompass polymer materials only and not ceramics which are not "cured" by the conventional definition of curing.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Barbara J. Musser whose telephone number is (571) 272-1222. The examiner can normally be reached on Monday-Thursday; alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Blaine Copenheaver can be reached on (571)-272-1156. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

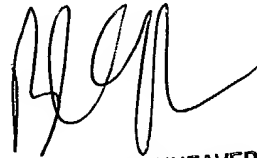


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For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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